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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,860

06/14/2005

Timothy Daniel Shaffer

2003B133C

9295

23455 7590 05/02/2007
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EXAMINER

RABAGO, ROBERTO

ART UNIT

PAPER NUMBER

1713

MAIL DATE

DELIVERY MODE

05/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/538,860

Applicant(s)

SHAFFER ET AL.

Examiner

Roberto Rábago

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-83 and 87-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-11, 14-83 and 87-95 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/27/2007;
6/14/2005; 1/8/2007;2/12/2007.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/12/2007 has been entered.

Comments on Claim Interpretation

2. The claims have been amended to require that the parameter m is determined for each polymer by direct solution of the equation stated in the claims, based on determined values for A and F . Previously, a stated method of determining m was by a best-fit curve-fitting procedure over a spread of several values of A and F in a particular diluent, as previously recited in the specification at [0096] and [00218].

3. In reciting range endpoints for numerous claimed parameters, applicants have used the phrasing "from greater than" and "from less than". For example, in claim 1, the range for parameter m is claimed as "from greater than 1.5." Consistent with the disclosure of the specification, this phrasing is interpreted to have the same meaning as if the word "from" were absent; i.e., "from greater than" is identical in scope to "greater

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than.” Therefore, the word “from” adds no limitation or meaning to the phrases “from greater than” and “from less than”. If applicants disagree with this interpretation, they should either amend the claims to recite an alternative meaning, or explain the alternative meaning and identify support in the specification as filed.

Information Disclosure Statement

4. The information disclosure statement filed 2/27/2007 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the Matyjaszewski reference has not been considered because applicants' submission consisted of nothing but the title page and publication page.

5. The information disclosure statement filed 6/14/2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the lined-through references, consisting of references without an integral English language abstract, have not been considered. The abstracts for these references which are included in the IDS as separate entries have been considered on the basis of their English language content.

The initialed foreign language references cited on any of Applicants' IDS forms have been considered solely on the basis of their attached English language abstracts, and any discussion thereof in the specification.

Claim Rejections - 35 USC § 112

6. Claims 35-83 and 87-95 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 35 and 42 (and claims 36-41, 43-83 and 87-95 by dependency), the presence of preferred embodiments renders the claimed scope indefinite.

Claim Rejections - 35 USC § 102 and/or 103

7. Prior to discussion of the applied references, the following is noted with respect to the claims.

(a) The instant claims are directed to a copolymer comprising an isoolefin (IO) and a multiolefin (MO), wherein the value of m as a function of A and F (each unlimited) is from 1.1 to 1.25 or greater than 1.5. Therefore, since all IO/MO copolymers will inherently have a value of A and F , applicants are claiming all conceivable IO/MO copolymers except those with m values which are either less than 1.1, or greater than 1.25 up to 1.5.

(b) The parameter F , corresponding to the IO-MO-MO triad fraction required to calculate m , is an exceedingly obscure and rarely-measured parameter. However,

applicants have stated in the Reply to the First Written Opinion from the International Application, that the value of m may be estimated for an isoprene/isobutylene copolymer using, as variables, only the mole fractions of each component in the feed and resulting polymer. Therefore, copolymer samples over a range of isoprene feed mol% would necessarily result in a range of values for m . This feature is confirmed in the declaration of T.D. Shaffer filed 2/12/2007, wherein the second version of Table 26 shows that substantial variation of m is obtained by varying only the mol% isoprene, and that this effect is present in each of the various solvents, with a trend toward decreased values of m as mol% isoprene is increased.

(c) The declaration of T.D. Shaffer filed 2/12/2007 has revealed that the value of m in conventional solvents such as methylene chloride is a function of isoprene mol%. Example 149, stated to be a Comparative Example, in fact includes the sample at 2.55 mol% isoprene which is within the claimed scope. Clearly, the use of hydrofluorocarbons diluents is not required to obtain the claimed polymers when using conventional solvents and catalysts. Furthermore, it is noted that although Example 150 is stated to be an example of the invention, the samples at 3.32 and 6.98 mol%, with m values of 1.3, are not within the scope of the claims.

8. Claims 1, 2, 5-8, 10, 11, 14-16, 35, 36, 42-45, 47-82, 87 and 91-94 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Saylor et al. (US 2,494,585).

The reference discloses in Examples 1-3 the copolymerization of isobutylene and isoprene in methyl chloride at 3 %, 5 % and 1.5 % isoprene. The reference has not reported the value of m ; however, applicants' comparative example 149 shows that as the mol% of isoprene falls, the value of m rises. Since the reference has exemplified isoprene mol% as low as 1.5%, it would be expected that the reference example would have m values within the range of 1.5-2.5 in view of the fact that applicants have shown in Example 149 that at 2.55 % isoprene in methylene chloride may result in a copolymer of $m=2.1$. The burden of proof is shifted to applicants to show that the reference examples would not include the claimed value of m .

In the event that applicants can show that the examples of the reference would not include the claimed value of m , then one of ordinary skill in the art would be motivated to make a copolymer which would have the claimed value of m because the reference suggests that the multiolefin content may be as low as 0.5% (col. 4, lines 5-11). Copolymers with such low levels of isoprene would be expected to have the claimed value of m in view of the trend shown in applicants' example 149 wherein the m value increases as % isoprene decreases.

Regarding claims 35, 36, 42-45 and 47-82 set forth as product-by-process, the record contains no basis to conclude that the specified process steps would exclude the reference products from the exceedingly broad scope of the claims.

Regarding claims 87 and 91-94, although unreported, the claimed values would be expected in the exemplified polymers because applicants have claimed the vast

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majority of conventional Mw, MWD and Mooney viscosity values expected for conventional isoprene/isobutylene copolymers.

9. Claims 1, 2, 5-8, 10, 11, 14-16, 35, 36, 42-45, 47-82, 87, 88 and 91-94 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Priola et al. (US 4,107,417).

The reference discloses in Examples 1-13 the copolymerization of isobutylene and isoprene in methyl chloride, and using a variety of transition metal catalysts in combination with ethylaluminum dichloride, resulting in high molecular weight copolymers with isoprene percentages of about 2-3%. The reference has not reported the value of m ; however, applicants' comparative example 149 shows that as the mol% of isoprene falls, the value of m rises. Since the reference has exemplified isoprene mol% as low as 2.1%, it would be expected that the reference example would have m values within the range of 1.5-2.5 in view of the fact that applicants have shown in Example 149 that at 2.55 % isoprene in methylene chloride may result in a copolymer of $m=2.1$. The burden of proof is shifted to applicants to show that the reference examples would not include the claimed value of m .

In the event that applicants can show that the example of the reference would not include the claimed value of m , then one of ordinary skill in the art would be motivated to make a copolymer which would have the claimed value of m because the reference suggests that the multiolefin content may be as low as 0.5% (col. 2, line 44).

Copolymers with such low levels of isoprene would be expected to have the claimed

value of m in view of the trend shown in applicants' example 149 wherein the m value increases as % isoprene decreases.

Regarding claims 35, 36, 42-45 and 47-82 set forth as product-by-process, the record contains no basis to conclude that the specified process steps would exclude the reference products from the exceedingly broad scope of the claims.

Regarding claims 91-94, although unreported, the claimed values would be expected in the exemplified polymers because applicants have claimed the vast majority of conventional MWD and Mooney viscosity values expected for conventional isoprene/isobutylene copolymers.

10. Claims 9, 17-34, 39-41, 46 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saylor et al. (US 2,494,585).

Regarding claims 9, 17 and 46, the parent claims are discussed with respect to this reference above. Missing from the examples is a multiolefin of greater than 5%; however, the reference recommends a range of 0.5-30% multiolefin (col. 4, lines 5-11), providing suitable motivation to obtain the required percentage.

Regarding claims 18-34 and 39-41, the reference discloses in Examples 1-3 the copolymerization of isobutylene and isoprene in methyl chloride at 3 %, 5 % and 1.5 % isoprene. The reference has not measured the value of m ; however, applicants' comparative example 149 shows that as the mol% of isoprene falls, the value of m rises. Since the reference has exemplified isoprene mol% as low as 1.5%, it would be expected that these reference examples would have m values within the range of 1.5-

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2.5, as previously discussed. However, the reference states that the copolymer may contain multiolefin in the range of 0.5-30% multiolefin (col. 4, lines 5-11), and copolymers with higher amounts of multiolefin, (i.e., 15-30%) would be expected to have a value of m within the claimed range. The burden of proof is shifted to applicants to show that copolymers with the recommended multiolefin percentages would not include the claimed value of m .

Regarding claim 95, official notice is taken that the blending of isoprene/isobutylene copolymers with at least one of the numerous polymers stated is so conventional that no additional reference need be cited to support motivation to combine the reference copolymer with another conventional polymer or rubber as claimed.

11. Claims 9, 17, 46, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Priola et al. (US 4,107,417).

The parent claims are discussed with respect to this reference above. Missing from the examples is a multiolefin of greater than 5%; however, the reference recommends a range of 0.5-10% multiolefin (col. 2, line 44), providing suitable motivation to obtain the required percentage.

Regarding claim 95, official notice is taken that the blending of isoprene/isobutylene copolymers with at least one of the numerous polymers stated is so conventional that no additional reference need be cited to support motivation to

combine the reference copolymer with another conventional polymer or rubber as claimed.

Double Patenting

12. Claim 83 is provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1, 10, 18, 27 and 35 of copending Application No.

11/009,660. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

13. Claim 90 is provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1, 10, 18, 27 and 35 of copending Application No.

11/010,092. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Allowable Subject Matter

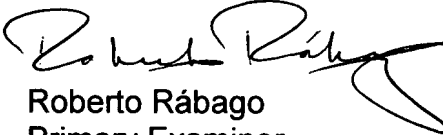
14. Claims 3, 4, 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberto Rábago whose telephone number is (571) 272-1109. The examiner can normally be reached on Monday - Friday from 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Roberto Rábago
Primary Examiner
Art Unit 1713

RR
April 28, 2007